miles of the base, when Mertz succumbed, and Mawson was only saved by the discovery of a *cache* of food left by a search party, after he had made a long and dreadful solitary journey.

Dr. Mawson's principal object was to explore that section of Antarctica which lies due south of Australia (Fig. 1). To the east of his own field of operations lies the region opened up by the work of Scott and Shackleton; to the west of the base established by his colleague, Mr. Frank Wild, a thousand miles distant in a direct line from his own, the German *Gauss* expedition was at work in 1902–03, and gave the name of Kaiser Wilhelm II. Land to its sphere of action. The intervening area was very little known; landings had not been previously made in either of the districts covered by Dr. Mawson and Mr. Wild, and the coast-line was only known—and that, as the present expedition has proved, by no means certainly—at a few points reported by expeditions made more than seventy years ago, by Balleny, by Dumont D'Urville, and by Wilkes.

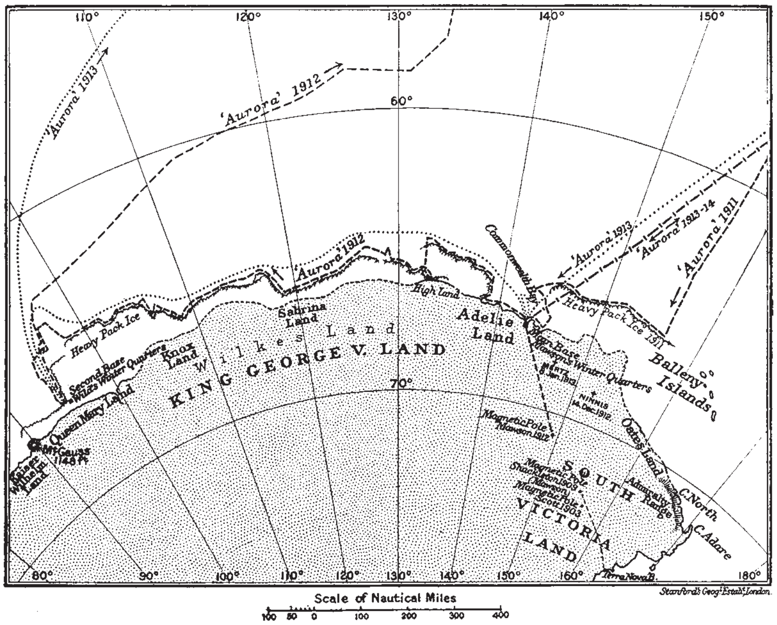

Fig. 1.—Field of operations of the Mawson Antarctic expedition.

The data are, of course, insufficient to attempt as yet any detailed estimate of the scientific value of the work of Dr. Mawson's expedition. But it must be substantial. We know something of it already from the reports of Mr. Wild and Captain J. K. Davis (who commanded the ship of the expedition), which they made on returning from the Antarctic last March.

The wireless telegraphic station established on Macquarie Island has already proved its worth, and may form the first step in a system of weather-forecasting, important not only to shipping in Australian waters, but to agriculturists and others in Australia. We hear of the discovery of minerals, including coal and copper. Exploratory journeys over the sea-ice and the continental plateau are stated to have covered 2400 miles from the main base and 800 miles from the western base. From the ship valuable results have been obtained by deep-sea dredging and other means, and the antarctic continental shelf has been traced through 55 degrees of longitude. It must also be remembered that the work of the general scientific programme has been continued at the main base through two complete years, though through one only at the western base.

NOTES.

The following fifteen candidates have been selected by the council of the Royal Society to be recommended for election into the society:—Dr. E. J. Allen, Mr. R. Assheton, Mr. G. T. Bennett, Prof. R. H. Biffen, Dr. A. E. Boycott, Mr Clive Cuthbertson, Dr. H. H. Dale, Prof. A. S. Eddington, Prof. E. J. Garwood, Mr. T. H. Havelock, Dr. T. M. Lowry, Prof. D. Noël Paton, Mr. S. Ruhemann, Dr. S. W. J. Smith, and Dr. T. E. Stanton.

Mr. J. Dewrance has presented the sum of 2000*l.* to the donation fund of the Royal Society. The income arising from this fund is used mainly for the promotion of experimental researches.

A year ago announcement was made of a gift of 15,000*l.* to the Middlesex Hospital for the purpose of building an institute of pathology, a department greatly needed in order to raise the hospital to the standard required by modern scientific medicine. At the annual court of governors of the hospital on February 26, Prince Alexander of Teck announced that the donor was Sir John Bland-Sutton.

In our issue of February 12 (p. 667) particulars were given of the conference of persons interested in the physical aspects of the study of the air, the earth, and the sea, to be held in Edinburgh next September. Sir John Murray is to be the president of the conference. We have since received information that arrangements are in progress for a Meteorological Congress to be held in Venice in the same month, and that meteorologists of all countries are to be invited to it. The president of the executive committee of this proposed congress is Prof. S. Urbani, director of the Patriarcal Meteorological Observatory, Venice.

The London School of Tropical Medicine has sent an expedition to China to study the mode of dissemination of human diseases caused by trematode parasites, especially bilharziosis, and the relation of such diseases to those occurring in domestic animals. Investigations into ankylostomiasis will also be carried on. The members of the expedition are Dr. R. T. Leiper, helminthologist of the Tropical School, Surgeon E. L. Atkinson, R.N., and Mr. Cherry-Garrard. The two last-named were members of Scott's Antarctic Expedition, and the name of Surgeon Atkinson is familiar to the public as the leader of the search party which recovered the bodies of Capt. Scott and his companions. Surgeon Atkinson also made a large and important collection of Antarctic parasites, and since his return from the expedition he has been occupied in working out the helminths in collaboration with Dr. Leiper. Drawings of the helminths collected were exhibited by Dr. Leiper and Surgeon Atkinson at a recent scientific meeting of the Zoological Society. The collection of Antarctic Protozoan parasites still remains to be worked out.

THE recent review of the position of Army aviation in a statement to Parliament by the Secretary of State for War is interesting as showing the progress of aviation in England, and also the need for further improvement before aeroplanes can be regarded as having reached a satisfactory degree of development. Six years from the date of the first successful flights in Europe, it can be said that in the year just ended there were only six flying days on which flights by officers and men of the Royal Flying Corps did not take place. This is a significant indication of the rapidity of development of the science of aviation which is made still more noticeable by the statement that during this time journeys amounting to more than 100,000 miles were made without any loss of life. It appears that aeroplanes are being taken out in stronger and stronger winds, and a record of nearly seventy miles an hour stands to the credit of one of the officers of the Royal Flying Corps. In spite of such striking performances, it is clear that there is still much to be learnt. Colonel Seely pointed out the necessity for keeping 200 machines in being, so that 100 of them may be ready for use at a given time. In other words, at least half the life of a modern aeroplane is spent in the repair shop. This fact makes it necessary to attempt to raise the factor of safety of aeroplanes, and an inspection department has been organised by the War Office to deal with this aspect of the problems relating to aviation.

THE committee of the Lister Memorial Fund has commissioned Sir Thomas Brock, R.A., to execute a medallion portrait of the late Lord Lister, to be placed in Westminster Abbey. This will form part of the international memorial to commemorate the priceless services of Lord Lister to the cause of science and the alleviation of human suffering. Further subscriptions are required to enable the committee to carry out adequately the proposed scheme for the establishment of an International Lister Memorial Fund for the advancement of surgery. Among the subscriptions recently received are the following:—American Surgical Association, 135*l.*; received through Dr. W. W. Keen, of Philadelphia, 35*l.* (second donation); Committee of Surgeons in Holland, 125*l.*; faculty of medicine, University of Copenhagen, 109*l.*; members of the medical profession in Victoria (Australia), 91*l.*; Medical and Surgical Societies in Japan, 31*l.*; Union of Swedish Hospital Surgeons, 20*l.*; Newcastle-on-Tyne committee and members of the Clinical Society, 113*l.*; City of Belfast committee, 54*l.* Donations may be sent to the honorary treasurers of the fund (Lord Rothschild and Sir Watson Cheyne) at the Royal Society, Burlington House, W.

PROF. ERNST HAECKEL's eightieth birthday (February 16) has just been celebrated with natural enthusiasm at Jena. The heartiness of the congratulations from far and near must have delighted the veteran, who has had the great reward of seeing the successful development of the evolutionist doctrine of which he was an early champion. There were some noteworthy addresses summing up various aspects of his work, one of the weightiest being that delivered by Prof. Maurer, director of the Anatomical Institute, and published by Mr. Gustav Fischer, Jena. He refers to Haeckel's education and the influences of Leydig, Kölliker, and Virchow (then inclined to be an evolutionist), and still more of Johannes Müller, the "Origin of Species," and Gegenbaur. It was in the early days of his friendship with Gegenbaur that Haeckel wrote his monumental "Generelle Morphologie," in many ways the greatest of his works. We have become familiar with much of its teaching, *e.g.* that the individual development is essentially related to the racial evolution, or that classification is an attempt to discern a genealogical tree, and we are thus apt to forget what forceful new ideas these once were. Prof. Maurer directs attention to Haeckel's strong historical sense, so well expressed in the early chapters of "The Natural History of Creation," to the permanent influence that his radiolarian work (he described some 4000 new species) had throughout his life, to the extraordinary success of his educative expository writings, to his exceptional talent as an artist, to his unwavering consistency and courage, often expressed in polemical writing which gave little hint of the charm of his personality, and to the strenuousness with which he has realised the ever serious purpose of his life. Since an unfortunate accident a few years ago, Haeckel has not been able to go about, but it is delightful to hear that he is still youthful in spirit, able to follow the progress of science, and even to share in it. We would join in the congratulations which have been recently offered to him.

MR. W. CAMERON FORBES is about to start for Central and South America, for the purpose of collecting specimens of birds for the museum of Harvard University.

THE death is announced, in his seventy-sixth year, of Dr. L. Schöney, late professor of pathology and clinical microscopy in the New York Eclectic Medical College. He had made numerous contributions on botany and histology to scientific journals.

DR. R. K. DUNCAN, director of the Mellon Institute of Industrial Research, and professor of industrial chemistry at the University of Pittsburg, has died at the age of forty-five. He was a Canadian by birth, and was educated at the University of Toronto. After teaching science for several years in various American secondary schools, he was appointed in 1901 to the chair of chemistry in the Washington and Jefferson College. In 1906 he became professor of industrial chemistry at the University of Kansas, where he initiated a new scheme of industrial fellowships which has since grown to large proportions. His Pittsburg appointment dated from 1910. He discovered new processes for manufacturing glass and phosphorus.

He edited the "New Science Series," and was the author of "The New Knowledge," "The Chemistry of Commerce," and "Some Chemical Problems of To-day." Dr. Duncan was popularly known through his articles on radio-activity in *McClure's Magazine,* and on industrial chemistry in *Harper's,* for which he made special inquiries abroad.

AMONG the victims of the *Titanic* disaster in April, 1912, was Mr. H. Forbes Julian, whose work as a mining engineer, and for metallurgical science, was referred to appreciatively at the time in these columns (vol lxxxix, p. 325). On February 24 a memorial tablet erected by a committee which included the names of many distinguished men of science was unveiled to Mr. Julian in St. Mary Magdalene Church, Torquay, by the Ven. Archdeacon of Totnes, in the presence of a large congregation. The inscription on the tablet is as follows:—"Ad Majorem Dei Gloriam. This tablet is erected by a wide circle of friends in affectionate remembrance of Henry Forbes Julian, member of the Institution of Mining and Metallurgy, born Ascension Day, 9th May, 1861; married in this church 30th October, 1902; passed away 15th April, 1912. During the whole of his working life he laboured at the solution of metallurgical problems in three Continents, and both by his writings and practical skill exercised an influence which will long endure. He was amongst those who gave their lives for others in the disaster which befell the R.M.S. *Titanic.* This heroism and self-denial called forth admiration from the Throne to the cottage. 'Greater love hath no man than this, that a man lay down his life for his friends.'"

THE duration of bright sunshine at Greenwich in February was 106 hours, which is exactly double the average of the past thirty years, and is the brightest February on record; the highest previous record for February was ninety-nine hours in 1899. In February this year at Greenwich there were twelve days with more than five hours' sunshine, whilst in July last year there were only seven days with more than five hours' sunshine. The total hours of bright sunshine in February are ten hours more than in the whole of July last year. At Kew the duration of bright sunshine in February was eighty-one hours, at South Kensington sixty-nine hours, and in the City, at Bunhill Row, 44 hours, the latter being ten times more than in January. The following gives the duration of bright sunshine at a few stations in England, chosen promiscuously from the reports of the Meteorological Office. For the several stations the duration was:—Dover, 119 hours; Hastings, 111 hours; Yarmouth, 108 hours; Margate, 106 hours (the same as at Greenwich); Brighton, 103 hours; Torquay, about 80 hours; Bath, 70 hours; Liverpool, 66 hours; and Buxton, 55 hours. The excess of sunshine in and round London is far more striking than in other parts of England.

THE inaugural meeting of the Institution of Petroleum Technologists was held at the Royal Society of Arts on Tuesday, February 3. Sir Boverton Redwood, the president of the institution, who occupied the chair, said, in the course of his opening remarks, that the aims of the institution are to enable technologists engaged in the petroleum or shale oil industry to meet, correspond, and accumulate trustworthy information regarding the production or winning of petroleum and oil-shale, the conversion of the raw materials into manufactured products, and the characters and uses of these products, together with their transport and storage; and, in the second place, to promote the better education of persons desirous of becoming professional consulting petroleum technologists, engineers, geologists, or chemists, and to elevate the professional status of those employed in the industry by setting up a high standard of scientific and practical proficiency, and by insisting upon the observance of strict rules in regard to professional conduct.

AT the thirty-sixth annual general meeting of the Institute of Chemistry, held on Monday, March 2, the president, Prof. Raphael Meldola, who was in the chair, referred, in the course of his address, to the endeavours of the institute to secure fuller recognition for the profession of chemistry. The council of the institute, in a memorandum submitted to the Royal Commission on the Civil Service, stated that the chemical staff in the department of the Chief Inspector at Woolwich Arsenal should be controlled by a chemist of the highest efficiency. The real expert whose knowledge and experience are of most value to the community is the highly trained man who has specialised in some particular field. Surely such a man is the most competent to control the work of any public department which is concerned with his own subject. Why, therefore, should there be this tendency to subordinate expert scientific service to non-expert control? While the medical service takes army "rank," the chemist, whose services are of equal importance, not only takes no "rank" at all, but is made responsible to superiors having no special knowledge of his subject. This state of affairs, rendering as it does the public service of chemists an unattractive career to the best talent in the profession, is fraught with danger to the future well-being of the country, and is a shortsighted policy which, in time of trouble, may well lead to disaster. Prof. Meldola then dealt at considerable length with the report of the conference of professors of chemistry, held under the auspices of the institute in October last, which was attended by professors from practically all the principal educational centres of the country, the institute thus providing an arena for the free discussion of the broad question of the education of professional chemists. Sir William Ramsay, in proposing a vote of thanks to the president for his address, endorsed the views which had been expressed with reference to placing men having no technical knowledge in the control of experts, and remarked on the absurdity of requiring them to sign reports only fully understood by the specialist.

MISS M. A. MURRAY discusses, in the February issue of *Man,* the evidence for the custom of killing the king in ancient Egypt, in connection with the Osiris cult, as explained by Dr. J. G. Frazer in "The Golden Bough." She interprets the name of Isis as Isé, "the throne-woman," and Osiris, or Usiri, "the occupier of the throne, the king." She notes that Arab legends of the ancient kings of Egypt mention the disappearance of two monarchs, and thus seem to preserve the tradition of the divine spirit leaving the world. The art evidence begins only from Roman times, and the ceremonial record is less conclusive, being connected with the obscure Sed festival, of which she offers a new explanation. It seems to be connected with a fertility cult. But the Egyptian evidence, though when the details are taken together, it is suggestive, is far from being so clear as the practice of king-killing among the Shilluks of Fashoda, which was fortunately recorded in time for its use by Dr. Frazer in the new edition of his great work.

THE January number of *Eugénique,* which is the monthly journal of the Société francaise d'Eugénique, is largely occupied by Dr. Saleeby's lecture on the progress of eugenics, which was delivered before the society on January 7. In the discussion which followed it, M. March, the head of the French Government Statistical Department, made some interesting observations on the relations between biometry and Mendelism. He pointed out that Mendel's laws themselves are statistical laws based on the theory of probabilities, while biometry is simply the application of statistical methods to biological problems. With regard to the controversy concerning the effect of alcoholism on the offspring, M. March condemns those as unscientific who criticise the results obtained by the Galton Laboratory, on the ground that they render weaker the struggle against alcoholism, and says further :—"Temperance societies know well the eternal objection made by peasants, 'Look at my neighbour; he is eighty years of age, in splendid health, and has always drunk.' On this point, as on all others, numerous observations, well conducted and well analysed, are the best means of reaching the truth."

FROM an article in the *Journal of Heredity,* vol. v., No. 2, we learn that, as the result of experiments conducted by Mr. Alexander Graham Bell in Nova Scotia, high feeding of ewes just before the autumn pairing season results in the production of a much higher percentage of female lambs than ordinary, the proportion of this sex in his flock being 72 per cent., whereas in those of neighbouring farmers there was a percentage of 88½ males.

THE first number of a new monthly journal devoted to microscopy has been issued. It is entitled *The Journal of Microscopy and Natural History Mirror,* and is edited by Mr. Edwards, the secretary of the Postal Microscopical Club, Reading. Its object is to foster the study of natural history with microscope and camera, and to help and instruct the amateur microscopist. The present number contains short articles on photomicrography, pond-life, mounting, and so on.

BULLETIN No. 36 of the Agricultural Research Institute, Pusa, India, contains a note by Major Holmes, on the McFadyean staining reaction for anthrax bacilli. This consists in staining under-fixed films with methylene-blue, by which procedure the bacilli are stained blue, and appear to be surrounded with a pale purple capsule. Major Holmes confirms the diagnostic value of this reaction, and makes the interesting observation that cattle in India rarely die of anthrax, even if inoculated with it.

IN *The American Naturalist* for February, Prof. W. E. Castle directs attention to the interest—from the point of view of Mendelian colour-inheritance—of two new colour-phases of the brown rat, respectively known to breeders as the pink-eyed yellow, fawn, or cream, and the black-eyed yellow, fawn, or cream. The former seems to have first appeared about 1910 or 1911, while the originator of the second strain, as we learn from an appendix to the paper, was brought to Liverpool by a ship in 1912. Their special interest lies in the fact that yellow phases—due to the suppression of black and brown pigment—has hitherto been unknown in this species.

A REMARKABLE instance of the needless multiplication of technical names in zoology has recently occurred in the case of Grévy's zebra. Some years ago Mr. R. I. Pocock pointed out that this species was so markedly distinct from other Equidæ as to be worthy of subgeneric separation, although he did not suggest a new subgeneric title. In 1912, Dr. Max Hilzheimer (*Abh. Senckenberg Ges.,* vol. xxi., p. 85), proposed for this species the subgeneric name, Megacephalon, which is preoccupied (1846) by a well-known genus of birds. In the same year Mr. N. Heller (Smithsonian Misc. Collect., vol. lx., No. 8, p. 1), apparently without knowledge of Dr. Hilzheimer's work, proposed the name Dolichohippus, in a generic sense. Unaware of this, Dr. A. Griffini, in an article on zebras and quaggas, orginally published in vol. iv. of *Natura* (Padua), but of which separately paged reprints have just reached this country, suggests the name, Ludolphozecora (from "Zecora," the designation by which Ludolphus alluded to the species), to replace the preoccupied Megacephalon.

A COPY has been received from Washington of the report of the secretary of the Smithsonian Institution for the year ending June 30, 1913. We learn from it that a plan has been formulated and some progress has been made in certain lines of field work for a geological survey of Panama, under the joint auspices of the Isthmian Canal Commission, the United States Geological Survey, and the Smithsonian Institution, and a grant has been made from the institution's funds toward the expenses of such investigation. The general plan of the survey comprises a systematic study of the physiography, stratigraphy, and structural geology, geological history and correlation, mineral resources (including coal, oil, and other fields), petrography and palæontology of the canal zone, and of as much of the adjacent areas of the isthmian region as is feasible. The biological survey of the canal zone, organised by the institution in 1910, was brought to a close during the year so far as field work was concerned, and some of the results have been referred to in these columns.

IT has long been recognised that a necessity exists for the improvement of the important medicinal plants.

One of the first steps necessary to inaugurate such work is to determine the variation of the active constituents in individual plants and the extent to which such variation is influenced, if at all, by the various factors affecting the growth and cultivation of the plant. Investigations in this direction have been carried out with belladonna recently, and are reported by Mr. A. F. Sievers to the new *Journal of Agricultural Research* (vol. i., No. 2). The variation in the alkaloidal content of the leaves throughout the season was determined, but no relation appeared to exist between the physical appearance of the plant and the amount of alkaloid present. It was found advisable, however, to aim for a greater yield of young leaves of rather lower content than to delay picking until higher content and lower aggregate yield is only obtainable. The plants experimented with show, among themselves, a very great variation in alkaloidal content, separation into two groups being possible, the content of the one being twice that of the other. By selection and cultural means the total production of alkaloids ought to be capable of great increase.

A REPORT by Dr. J. V. Eyre on the possibility of reviving the flax industry in Great Britain has been published as a supplement to the Journal of the Board of Agriculture. A brief historical review of the subject is given, followed by a discussion of the effect of soil, manure, climate, and cultivation, on the crop. Harvesting, retting, and subsequent treatment are described in detail, and the whole forms a valuable guide to the condition of the industry in this country. The crop has many advantages to recommend its more general adoption, especially by the small holder, provided that efforts are directed to the preparation of high grades of fibre. There certainly is reason for believing that the judicious revival of the industry, managed according to improved methods, would be productive of benefit to British agriculture, and would induce people to find regular employment in rural districts by creating a demand for skilled labour.

THE indexes to the Physics and Electrical Engineering volumes of *Science Abstracts* for 1912 have reached us. The former volume extends to 750 pages, with more than 2000 abstracts, and the latter to 670 pages, with nearly 1300 abstracts. The greater average length of the electrical engineering abstracts appears due to descriptions of installations and appliances. The initials of the abstractor at the foot of each abstract and a reference to the list of abstractors at the beginning of each volume, show that in nearly all cases the abstract has been written by one who has a special knowledge of the subject, and so long as this characteristic of Science Abstracts is maintained, so long will it continue to enjoy the confidence of those who make use of it. The indexing appears adequate, the name-index in the physics volume covering thirty and the subject-index fifty-six pages.

WE have received from the Reichsanstalt a number of memoirs dealing with the work done there, which have appeared in recent numbers of the *Annalen der Physik*, the *Zeitschrift für Instrumentenkunde*, and other periodicals. One by Dr. F. Henning deals with new determinations of the boiling points of oxygen and carbonic acid, and the freezing points of mercury and other liquids. The temperatures were measured by five platinum resistance thermometers, which had been previously compared with the constant volume hydrogen thermometer. The static method was used for the boiling points. The results are:—Normal boiling points: Oxygen, $-182{\cdot}97^\circ$, carbonic acid, $-78{\cdot}53$; freezing points: mercury, $-38{\cdot}89$, ethyl ether, $-123{\cdot}6$; melting points, carbon bisulphide, $-112{\cdot}0$, chloroform, $-63{\cdot}7$, chlorobenzene, $-45{\cdot}5^\circ$ C. Others by Drs. W. Jaeger and H. von Steinwehr deal with comparisons of various copies of the ohm amongst each other and with the mercury standard, and with current measurements with the silver voltameter. They show that the German ohm agrees with the English to within a few hundred thousandths, and that the electromotive force of a Weston cell is 1·01829 volt at 20° C.

THE White Star liner *Britannic* was launched from Messrs. Harland and Wolff's yard at Belfast on February 26. The following particulars of this vessel are taken from illustrated articles in *Engineering* and the *Engineer* for February 27. The principal dimensions are:—Length over all, about 900 ft.; breadth, extreme, about 94 ft.; depth moulded, 64 ft. 3 in.; total height from keel to navigating bridge, 104 ft. 6 in.; gross tonnage, about 50,000 tons; propelling machinery—reciprocating engines of 32,000 i.h.p. exhausting into a Parsons low-pressure turbine of 18,000 shaft-horse-power; sea speed, 21 knots. Accommodation is provided for 2,579 passengers and 950 crew, a total of 3,529 persons. The vessel is probably the strongest passenger ship structurally constructed up to the present time, and is so amply divided by longitudinal and transverse bulkheads that her destruction by any dangers of the sea is incredible. The double system of construction is carried up the sides of the vessel to a considerable distance above the load water line, and the walls are literally honeycombed with compartments. None of these compartments will be opened on the inner side during a voyage. There are sixteen transverse bulkheads, five of which extend to a height of more than 40 ft. above the deepest load line, and all the others are carried to a height of more than 21 ft. above the water line. The bulkheads are of very heavy construction. The lifeboat arrangements will meet fully the requirements of the recent International Convention.

MESSRS. FLATTERS AND GARNETT, LTD., have issued a supplementary catalogue of the lantern slides added to their stock during 1913. Among these additions are a large number of photographs of British wild flowers and a series of slides illustrating the commercial geography of the north of England, arranged by Dr. A. Wilmore.

AMONG recent additions made by Messrs. Jack to their "People's Books" are "Applications of Electricity for Non-Technical Readers," by Mr. A. Ogilvie, and "Wild Flowers," by Mr. M. Skene. The first book explains in simple language, which takes no previous knowledge of the science for granted, the elementary facts upon which the chief everyday applications of electricity are based. The volume on wild flowers contains two hundred black and white illustrations of common flowers, and descriptions of these and others arranged in chapters according to their colours. Thus we have chapters on white, yellow, red, blue, flowers, and so on. The price of each volume in the series is 6*d*. net.

OUR ASTRONOMICAL COLUMN.

STARS WITH VARIABLE RADIAL VELOCITIES.—In the *Astrophysical Journal* for January (vol. xxxix., No. 1, p. 39) Mr. Oliver J. Lee contributes numerous measures of variable radial velocities of stars determined in the course of measuring Bruce spectrograms. Of the twenty-eight stars to which reference is made, eighteen have been previously announced as spectroscopic binaries, but the remaining ten are new. The following table is abstracted from the information given in the paper, and indicates the star in question, position, magnitude, and class :—

Star	R.A.		Dec.		Mag.	Class
	h.	m.	°	′		
89 *f* Piscium	1	13	+ 3	5	5·3	A_2
73 ξ^2 Ceti	2	23	+ 8	1	4·3	A
125 Tauri	5	34	+25	50	5·0	B_3
40 Aurigæ	6	0	+38	30	5·3	A
24 Can. Ven.	13	30	+49	32	4·6	A_3
33 Boötis	14	35	+44	50	5·4	A
27 β Libræ	15	12	− 9	1	2·7	B_8
BD 25°4165	20	11	+25	17	4·8	B_3
33 *i* Aquarii	22	1	−14	21	4·4	B_8
18 λ Piscium	23	37	+ 1	14	4·6	A_5

SUN-SPOTS: THEIR INTERNAL MOTION AND SHORT-PERIOD VARIATIONS.—The fifth volume of the *Publikationen der Sternwarte des Eidg. Polytechnikums zu Zurich* contains two contributions, the first by William Brunner, on the investigation of the internal motions in sun-spots, and the second by Elsa Frenkel, on short-period variations in the frequency of sun-spots. The former is a detailed research, carried out in a systematic manner, on the internal motions, chiefly divergent. The chief result leads the author to associate this divergent motion with the origin and development phases of spot groups. The data employed were those of the period between January 1, 1887, and January 1, 1905, and were the result of observations made with the refractor of the Zurich Observatory. Numerous plates accompany the text. The second paper involves the discussion of the Zurich observations made during the period 1876–1911. Readers must refer to the original publication for the detailed account of the research, but the chief conclusions may be stated briefly as follows. The author finds a probable period of 200 days, but this is not apparent during the last three eleven-year periods, when the spot activity went below a certain limit. The length is not constant, but varies about a mean value of 150 to 200 days. The ordinate of the periodigram is about 100 times smaller than the eleven-year period, and the amplitude about ten times smaller than that of the eleven-year period. Another period of 68·5 days was indicated, but this will be investigated again at a later date. Attention is directed to the lengths of these two periods, namely 200 and 68·5 days, and the sidereal times of revolution of the two inner planets, namely Mercury, 87·9 days, and Venus, 224·7 days. The text is accompanied by a large number of plates showing the observed and smoothed curves of the daily relative numbers.

DETERMINATIONS OF GRAVITY IN EGYPT AND THE SUDAN.—Survey Department Paper No. 18 (Cairo) contains details of the determination of "g" at eight stations in Egypt and the Sudan, carried out by Mr. P. A. Curry, in connection with the geodetic survey. Almost the whole of the observations and the whole of the computational work have been done by Mr. Curry himself. The stations range from Helwân to Khartoum, nearly 15° of latitude, and the height above sea-level varies from 42 to 383 metres, but the topographical correction has been *nil* for each of the stations. The Stuckrath pendulum apparatus employed was borrowed from the South Kensington Museum, where it had been deposited after the return of Captain Scott's first Antarctic Expedition. This instrument provides essentially for the determination of the time of oscillation of each of a number of invariable pendulums swinging in separate cells of a vacuum chamber. Besides the correction due to the rate of the chronometer, *four* instrumental corrections need to be determined, namely, for temperature, pressure, amplitude of vibration, and flexure of pillar. Kew was taken as the base and Helwân was made the primary Egyptian station. 981·201 cm./sec.^{2} (based on the Potsdam system) was adopted as the value of "g" at Kew, and from a discussion of *ninety-eight* separate determinations 979·295 cm./sec.^{2} was obtained as the final value of this constant at Helwân, the probable error being ±0·0027. The values obtained for each of the stations have been reduced to sea-level and compared with the theoretical value for the latitude of the station given by Helmert's formula (1901). Remarkably close agreement obtains, ranging only between +0·009 and −0·013, whence it is concluded that there is nothing very abnormal about the values of gravity at these eight stations.

THE COBAR COPPER FIELD.

COBAR, on the western plains of New South Wales, 464 miles by railway from Sydney, is one of the most important, though not most profitable, of the copper fields in Australia; it yielded 6500 tons of copper in 1911, and has produced more than 90,000 tons since its discovery in 1869. The development of the field was hampered by its remote position and its semi-arid climate, for with a rainfall of only 15 in. it is surrounded in dry seasons by a wide, waterless tract. In its early days, however, the export of ore was once stopped by floods, which inundated the plains beside the Darling River for a width of fifty miles. Another trouble was an invasion in 1890 by millions of rabbits, which destroyed the vegetation by devouring the shrubs and ring-barking the trees.

The rocks of the mining field belong to three main divisions.[1] The oldest is the Cobar Series, which comprises semi-metamorphic sediments of perhaps pre-Silurian age; its most important member consists of thick beds of chert, which Mr. Andrews regards as a recrystallised organic precipitate. The account of these beds suggests their resemblance to the Heathcotian Series of Victoria, which are of Cambrian age. The middle division, the Mallee Tank beds, includes fossiliferous limestones, and its age is certainly Silurian. The upper division is Devonian, and includes a varied series of quartzites, shales, and claystones. The rocks of all three divisions have been disturbed by intense compression due to earth movements at the beginning and at the end of the Devonian period. The pressure was so powerful that the minimum dip observed in the Silurian rocks is 30°, and the Devonian

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[1] E. C. Andrews: Report on the Cobar Copper and Gold-field. Part i. (Department of Mines, New South Wales, Mineral Resources, No. 17). 1913, xi. Pp. 207+xlv plates+19 maps in separate portfolio.